How to prepare technical data sheets, safety data sheets and sending samples for natural food additive?

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Workbook for developing Technical Data Sheets, developing Safety Data Sheets and sending samples for natural ingredients for food.

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The expectations European buyers have of product documentation are increasing. Elaborate documentation has become a critical success factor for exports to Europe. A Technical Data Sheet (TDS), a Safety Data Sheet (SDS) and samples are crucial for buyers to determine if the quality of your product is suitable for them. You can use this workbook to improve your access to the European food ingredients market.

1. Building a dossier

European buyers require a dossier consisting of three components:

- Technical Data Sheet
- Safety Data Sheet
- Samples

Together, these three sources of data provide all that is necessary for a buyer to determine the suitability of your product.

2. Developing a Technical Data Sheet

A Technical Data Sheet (TDS) is a concise document with technical data on your product. The exchange of such technical data is an important step in the process leading to trade. European buyers require detailed technical data and a sample for analysis to determine the product's quality and assure that it complies with their requirements.

In a later stage of the negotiations, buyers also require company documentation such as certificates for food safety management.

There are nine steps to developing a TDS for natural food ingredients:

1. Identify the botanical origin
2. Indicate the availability

3. Describe the processing methods for your ingredient
4. List all classifications relevant for your product
5. Provide a physical analysis and a chemical analysis
6. State compliance with international standards
7. Indicate storage conditions
8. Identify potential applications
9. List your certificates

This workbook takes you through these nine steps using questions. By answering the questions you develop all the necessary information to draw up a Technical Data Sheet. Please review an example Technical Data Sheet (TDS) here.

Step 1: Identify the botanical origin

A Technical Data Sheet always starts with the identification of the botanical origin of the product.

Identifying the correct botanical origin according to the international nomenclature is very important to prevent misunderstandings between supplier and buyer.

You must use the International Code of Nomenclature for algae, fungi, and plants (ICN) to make sure that European buyers can recognise the name of the botanical origin of your product. ICN is a system of scientific names for plants. Its use provides an unambiguous way to identify a product.

In most cases the botanical origin of an ingredient is the main indicator of the properties of the product.

For example, the concentration of capsaicinoids (the major pungent compounds of paprika oleoresin) is much higher in types of paprika of *capsicum chinense* than in many types of paprika of *capsicum annuum*. Buyers of paprika oleoresin commonly use it as a colouring instead of a spice. They therefore prefer paprika oleoresin with minimal capsaicinoids content (i.e. minimal pungency).

Use the following table to answer all relevant questions related to botanical origin and use the answer in your Technical Data Sheet.

Subject	Please fill in
Establish the botanical origin of your ingredient and include a picture of the plant What is the family of plants? What is the genus? What is the species? What is the cultivar? What are the local and common synonyms? Ask a local expert in botany to determine the botanic origin.	For example: Family: *Solanaceae* Genus: *Capsicum* Species: *annuum L.* Variety: *annuum* Synonyms: chillies (English), paprika (English), Lalmirca (Hindi)

Step 2: Indicate availability of your product

Use the following table to answer the relevant question related to availability and use the answer in your

Technical Data Sheet.

Subject	Please fill in
Indicate availability of your product throughout the year When is the harvesting season?	For example: August-September

Step 3: Describe the processing of raw materials

Explaining the processing of raw materials helps European buyers understand how you manage the quality of your product. It also allows you to show your buyers what value you can add to the product with different processing methods. For example, if you are capable of reducing capsaicinoids content through additional processing, you can explain this in the TDS.

Use the following table to answer all relevant questions related to your processing of raw materials and use the answers in your Technical Data Sheet.

Subject	Please fill in
Describe the processing of raw materials Has the raw material been sorted and/or graded? (specify if relevant) What processing method has been used to obtain the product (e.g. extract)? What solvent has been used for extraction? What additional processing methods have been used to further enhance the product?	For example: Solvent extraction with hexane, after sorting out low-quality raw materials, and standardisation of the oleoresin for colour intensity with sunflower oil.

Step 4: List all classifications relevant for your product

Essential oils, gums, resins, extracts and other natural ingredients have diverse applications in a many different industries (e.g. food additives, cosmetics and aromatherapy). These industries use different classification systems to identify their products.

In a TDS for natural ingredients, you should use the sector classifications listed below:

All food additives, except for flavourings For example: gums (thickeners), waxes (glazing agents), paprika oleoresin (colouring matter)	The European food industry uses E-numbers to identify food additives. The European numbering scheme follows that of the International Numbering System (INS) of Codex Alimentarius. Every approved food additive in Europe has an E-number. For example, E 414 is gum arabic and E 901 is beeswax. You can find a complete list of E-numbers in European Regulation 1129/2011.
All natural ingredients	The chemicals industry, including manufacturers of flavours, fragrances, cosmetics and health products, uses the Chemical Abstracts Service (CAS) Registry Numbers. This enables them to clearly identify a chemical substance or molecular structure when there are many possible systematic, generic, proprietary or trivial names. For example, CAS 8000-48-4 is eucalyptus oil.
All natural ingredients	European buyers must comply with European Union regulation. In European Union regulation, commercial chemical substances are identified through a registry of European Community (EC) numbers assigned to each of these substances. For example, eucalyptus oil has EC number 283-406-2.
Flavourings For example: essential oils, oleoresins, absolutes	The flavourings sector also uses the Council of Europe's (CoE) Blue Book. This is also known as the book of flavourings. It provides safety-in-use evaluations. In addition to the Council of Europe (CoE) classification, European buyers of flavouring materials also use the classification by the Flavor and Extract Manufacturers Association of the United States (FEMA). These are also known as Generally Recognised As Safe (GRAS) numbers.
All natural ingredients	The Harmonised System (HS) is the international coding system used by customs authorities to classify traded products and determine which tariff rate applies. For example, gum arabic is HS 130120.
All natural ingredients	United Nations (UN) numbers identify hazardous substances for international transport. UN numbers are provided through the Globally Harmonized System of Classification, Labelling of Chemicals (GHS).

Use the following table to answer all relevant questions related to classification of your product and use the answers in your Technical Data Sheet.

Subject	Please fill in
List all classifications relevant for your product as mentioned above. What is the E-number? • Find the E-number of your product in EU Regulation 231/2012	For example (paprika oleoresin): E-number: 160c
What is the CAS number? • Check the monograph for your product of JECFA or check Material Safety Data Sheets of reputable companies for the CAS-number of your product What is the definition of the product according to EU Regulation 1333 / 1334? What is the EC number? • Search for the EC number in the database of the European Chemicals Agency	CAS number(s): 84625-29-6 and 68917-78-2 Flavouring preparation as per EU Regulation 1334, article 3.2.d EC: 283-403-6
What is the CoE name? • Find out when your product was evaluated by the CoE and check the respective Blue Book for the reference	CoE: 107
What is the FEMA number? • Find the number on the website of FEMA	FEMA: 2834
What is the HS code? • Check the EU Export Helpdesk	HS: 33019030 (i.e. extracted oleoresins)
What is the UN number? • Check for the substances in your product in the UN Recommendations on the Transport of Dangerous Goods or consult the authority in your respective country (e.g. customs)	UN number: 1169 (extracts, aromatic, liquid)
Does the product contain allergens? • Check if your product contains any of the substances listed in Annex II of EU Regulation 1169/2011 Download the ALBA list for other potential allergens and check if your product contains any of these substances	Free from allergens in Annex II of EU Regulation 1169/2011 and in the ALBA list

Tips:

Do you supply natural ingredients with applications in different sectors? Provide as many sector classifications in your TDS as possible.

Produce one TDS for all your potential buyers, including those from other markets. On the USA market, buyers also require Food and Drug Administration (FDA) numbers.

Step 5: Provide a physical analysis and a chemical analysis

Specifications (physical properties and chemical composition) are the most important part of a TDS. Many European buyers pay most attention to this part.

Buyers usually have strict specifications themselves. They need to verify if your product complies with their specifications by checking your specifications in the TDS.

The specifications of European buyers depend largely on the application of the ingredient. Some buyers require a high concentration of substance A in the ingredient. Other buyers might require a high concentration of substance B.

You can often find out which specifications buyers require by profiling your buyer.

Buyers of food colourings, for example, will require paprika oleoresin with a low capsaicinoids concentration (i.e. low pungency). Buyers of flavourings for spicy foods will accept a high capsaicinoids concentration (i.e. high pungency).

You must substantiate the specifications in your TDS with a Certificate of Analysis from an accredited laboratory. The Certificate of Analysis serves as proof for your buyer that you are capable of producing a product with the specifications you provide in your TDS.

Every sample you send to a European buyer must be accompanied by a Certificate of Analysis. The Certificate of Analysis must show that your sample meets the specifications of the buyer. The analysis of the sample must be done after production, when the product is ready to be exported.

European buyers usually analyse pre-shipment and after-shipment samples to determine if you comply with the specifications in the agreement.

Use the following table to answer all relevant questions related to physical and chemical analysis and use the answers in your Technical Data Sheet.

Subject	Please fill in

Provide a physical analysis Contract an accredited laboratory to provide a Certificate of Analysis containing answers to the following questions. If the laboratory capacity is not available in your country, you may have to hire a foreign laboratory. Questions for all natural ingredients: What is the colour? What is the aroma? What is the microbiological activity in your product?	Example (paprika oleoresin): Hue: dark red Colour: 100,000 Colour Units Aroma: Paprika and woody
Questions for essential oils and oleoresins: What is the density? What is the optical rotation? What is the refractive index? What is the solubility in water and oil?	Density (25 ^{0}C): 0.900 gr/L Solubility: insoluble in water, soluble in oil Not possible to measure optical rotation and refractive index
Provide a chemical analysis Contract an accredited laboratory to provide a Certificate of Analysis containing answers to the following questions. Questions for essential oils and extracts: What are the major constituents of your product and their shares in total weight? Which minor constituents are also of relevance to buyers (e.g. limonene in orange oil) and what is their share in total weight?	For example (paprika oleoresin): Carotenoid content (incl. capsanthin, zeaxanthin, capsorubin): 1.3 g /100 g
What is the solvent residue in your product? Questions for hydrocolloids: What is the purity of your product? What is the viscosifying strength?	Solvent (hexane) residue: <25 ppm (compliant with EU Directive 2009/32)

Step 6: State compliance with international standards

Use the following table to answer all relevant questions related to compliance with international standards and use the answers in your Technical Data Sheet.

Subject	Please fill in
State compliance with international standards	For example (paprika oleoresin):

Does your product meet the relevant EU standard? • If your product has an E-number, state compliance with standards in EU Regulation 231/2012 (including purity and microbiological criteria). • If your product does not have an E-number (e.g. essential oils), state compliance with standards in EU Directive 2009/32.	Compliant with standard for E160c as defined in EU Regulation 231/2012
Does your product's quality meet the relevant ISO product standard? • Find the ISO standard for your product on the ISO website (not available for all products).	
Does your product comply with EU legislation on Genetically Modified Organisms?	Free from GMOs and in compliance with Directive 2001/18 on Genetically Modified Organisms
Does your product comply with EU legislation on contaminants in food?	Compliant with Directive 1881/2006 on heavy metals and other contaminants in food

Step 7: Indicate storage conditions

Use the following table to answer all relevant questions related to storage conditions and use the answers in your Technical Data Sheet.

Subject	Please fill in
Indicate storage conditions	For example (paprika oleoresin):
What are the storage conditions?	Store in a dry cool place
What is the product's shelf life?	Shelf life: 36 months

Step 8: Identify potential applications

To European manufacturers natural ingredients are a raw material, not an end product. They need the properties or functionality of your natural ingredient for their end product. To manufacture these end products they use a range of ingredients.

Formulating foods, cosmetics and many other products is a complex task. Ingredients may react with other

ingredients, influencing their performance. For example, many hydrocolloids don't form a strong gel in an acidic environment.

Giving advice on performance of natural ingredients in end products is the task of specialised companies. In the natural gums market for example, specialised texturising systems suppliers can advise on performance of natural gums in end products. Their advice is particularly useful when the end product consists of many different ingredients that may react with each other, or when the product requires further processing (e.g. heating). Sometimes, manufacturers can do without such advice. This is the case for simple products with few ingredients or well-known end products. In such a case, you as a supplier can provide them with basic information on potential applications of your ingredients. This will help your buyers to determine suitability of your natural ingredient for their end product.

Use the following table to answer all relevant questions related to applications of your product and use the answers in your Technical Data Sheet.

Subject	Please fill in
Provide a list of typical applications What are common applications in Europe for your product? • Check books on food additives uses, such as the Food Additives Data Book. • If your product has uses as a flavouring or fragrance, check Perfumer & Flavorist's Flavor Libary or purchase the Flavour Raw Materials database of Leffingwell or the Book of Flavourings (Blue Book) of the Council of Europe. • If your product has uses as a thickener, purchase the Handbook of Hydrocolloids or Hydrocolloids in Food Processing.	Example (paprika oleoresin): • Seasonings • Marinades • Sauces • Soups

Step 9: List your certificates

European buyers appreciate it if you provide information on your compliance with international standards through certification. Certification assures buyers of the quality of your product.

In a Technical Data Sheet you should only include product certificates and certificates for systems relating to consumer labels (e.g. Fairtrade).

Product certificates provide proof that the product meets certain quality standards or has certain properties.

You should not include certificates for processes and systems, such as certificates for Food Safety Management Systems, in a TDS. These types of certificates are part of your company documentation.

Use the following table to answer all relevant questions related to your certificates and use the answers in your Technical Data Sheet.

Subject	Please fill in

List your certificates Do you have a Kosher certificate?	For example (paprika oleoresin): Kosher certified by OK
Do you have a Halal certificate? Do you have a GMO-free certificate? Do you have an organic certificate? Do you have a Fairtrade certificate? • Mention the names of the certifiers • Include copies of the certificates in your TDS or provide links to downloads Do you have an IFRA certificate (certificate of compliance to IFRA standards); IFRA/RIFM QRA Categories for Dermal Sensitization? The International Fragrance Association (IFRA) developed standards for many fragrance ingredients. These standards form the basis for the globally accepted and recognised risk management system for the safe use of fragrance ingredients.	Non-GMO certified by Intertek

Download an example Technical Data Sheet (TDS) for cardamom oil (392 kB, pdf). This TDS includes information relevant to cosmetics manufacturers to make the TDS suitable for both food and cosmetics markets.

Tips:

See our study on buyer requirements for natural food additives for an analysis of documentation requirements and other requirements in the European market.

Refer to our Market Intelligence on Natural food additives for more information on the European market for these products.

Use our workbook for developing documentation for cosmetic ingredients if you target the European cosmetics market.

3. Developing a Safety Data Sheet for essential oils and extracts

Why a Safety Data Sheet?

If you export essential oils and extracts to Europe they must be accompanied by a Safety Data Sheet (SDS). Even samples must be accompanied by a SDS. If you export other natural ingredients like gums, you do not have to provide an SDS.

The obligation to include a SDS with hazardous essential oils and extracts is determined by the European Union's regulation on Registration, Evaluation, Authorisation and Registration of Chemicals (REACH) (EC 1907/2006 and amended by 453/2010). The European Chemicals Agency (ECHA) is responsible for correct implementation of REACH.

An SDS provides information on hazards and risks, and instructions for safe handling of a product. The goal of the document is to reduce risks for the health of people handling the product and for the environment.

For example, an SDS for a toxic substance provides instructions for first aid measures in case of accidental release.

In addition to REACH, your own country may also have legislation on SDS. You will have to check with the authorities in your country if you need to provide additional safety data to comply with their requirements.

REACH makes European importers responsible for SDS. They must ensure that products which enter the European Union are accompanied by an SDS. This implies that importers increasingly demand that suppliers provide an SDS.

What knowledge do you need to develop an SDS?

To develop an SDS you need detailed technical knowledge of your product. The people responsible for preparing the SDS must know chemistry and European legislation (i.e. REACH).

If you don't have this technical knowledge within in your company, you should contract an accredited laboratory to develop an SDS for your product.

If you do have the technical knowledge within you company, you can use this workbook to prepare a basic SDS with the most essential information yourself.

How to develop an SDS?

This workbook takes you through the 16 sections of an SDS using questions. By answering the questions you develop the most essential information for an SDS. This basic SDS will provide the critical information for safe trade in your product. We have provided an example of a SDS for cardamom oil in the right column of below table.

The resulting SDS will not be fully comprehensive, because that requires extensive laboratory research outside of the scope of this workbook. If you need more information on compiling a fully comprehensive SDS, please see the ECHA guidance documents.

The SDS must comply with requirements of the EU REACH Regulation (1907/2006; Annex II) as amended by EC 2015/830. It must follow a 16-section format:

1. SECTION 1: Identification of the substance/mixture and of the company/undertaking
2. SECTION 2: Hazards identification
3. SECTION 3: Composition/information on ingredients
4. SECTION 4: First aid measures
5. SECTION 5: Firefighting measures
6. SECTION 6: Accidental release measures
7. SECTION 7: Handling and storage
8. SECTION 8: Exposure controls/personal protection
9. SECTION 9: Physical and chemical properties
10. SECTION 10: Stability and reactivity
11. SECTION 11: Toxicological information
12. SECTION 12: Ecological information
13. SECTION 13: Disposal considerations
14. SECTION 14: Transport information
15. SECTION 15: Regulatory information
16. SECTION 16: Other information

You can use the following databases to help you answers the questions below:

- Classification and Labelling Inventory of the European Chemicals Agency (ECHA). This database only contains information on registered substances. Other companies have already provided safety data on these substances to ECHA.
- Harmonised Classification in the Classification, Labelling and Packaging (CLP) Regulation (1272/2008).

Use the following tables to answer all relevant questions for all the steps of the SDS.

SECTION 1: Identification of the substance/mixture and of the company/undertaking	Example for cardamom oil
Section 1.1 What is the trade name for your product? What is the CAS number? What is the EINECS number? Section 1.2 What are the details of the supplier of this SDS? Section 1.3 What is the emergency telephone number of the supplier of this SDS?	Section 1.1 Trade name: Cardamom oil CAS number: 8000-66-6 EINECS number: 288-922-1 Section 1.2 Your company name Your address Section 1.3 Your emergency telephone number

SECTION 2: Hazards identification	Example for cardamom oil

<table>
<tr><td rowspan="11">Section 2.1
What are the hazard classifications of the product?
What hazard statements apply to your product?
Section 2.2
Which signal word has to be used on the label for your product?
Which hazard pictograms must be used on your product?
Are any substances of your product particularly hazardous or do the hazards apply to a mixture of substances (e.g. essential oil)?
Which precautionary statements apply to your product?</td><td colspan="4">Section 2.1</td></tr>
<tr><td colspan="2">Classification:</td><td colspan="2">Hazard statements:</td></tr>
<tr><td colspan="2">Flammable liquid 3</td><td colspan="2">H226: Flammable liquid and vapour</td></tr>
<tr><td colspan="2">Skin irritant 2</td><td colspan="2">H315: Causes skin reaction</td></tr>
<tr><td colspan="2">Skin sensitizer 1</td><td colspan="2">H317: May cause an allergic skin reaction</td></tr>
<tr><td colspan="2">Aquatic chronic 2</td><td colspan="2">H411: Toxic to aquatic life with long lasting effects</td></tr>
<tr><td colspan="4">Section 2.2
Signal word: Warning
Hazard pictograms:</td></tr>
<tr><td>GHS02
  </td><td>GHS07
  </td><td colspan="2">GHS09
  </td></tr>
<tr><td colspan="4">Hazard determining substance: Cardamom oil
Precautionary statements:
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P241: Use explosion-proof electrical/ventilating/lighting/equipment.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P321: Specific treatment (see on this label).
P501: Dispose of contents/container in accordance with local/regional/national/international regulations.</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>

SECTION 3: Composition/information on ingredients	Example for cardamom oil
Section 3.1 What is the chemical characterisation (e.g. ‘substance’ for essential oils)? What is the CAS No. description? What is the EC number? What is the FEMA number?	Section 3.1 Chemical characterisation: substance CAS number description: 8000-66-6 Cardamom oil EC number: 288-922-1

SECTION 4: First aid measres	Example for cardamom oil
Section 4.1 What first aid measures need to be taken following inhalation, skin contact, eye contact and ingestion?	Section 4.1 Description of first aid measures: Immediately remove any clothing soiled by the product. After inhalation: Supply fresh air and to be sure call for a doctor. In case of unconsciousness place patient stably in side position for transportation. After skin contact: Immediately wash with water and soap and rinse thoroughly. After eye contact: Rinse opened eye for several minutes under running water. After swallowing: If symptoms persist consult doctor.

SECTION 5: Firefighting measures	Example for cardamom oil
Section 5.1 What extinguishing agents should be used in case of fire? Section 5.3 What is the advice for firefighters?	Section 5.1 Suitable extinguishing agents: CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam. Section 5.3 Advice for firefighters: No special measures required.

SECTION 6: Accidental release measures	Example for cardamom oil

Section 6.1 What safety precautions need to be taken? Section 6.2 What environmental precautions need to be taken? Section 6.3 What measures need to be taken for cleaning up?	Section 6.1 Safety precautions: Wear protective equipment. Keep unprotected persons away. Section 6.2 Environmental precautions: Do not allow product to reach sewage system or any water course. Inform respective authorities in case of seepage into water course or sewage system. Do not allow to enter sewers / surface or ground water. Section 6.3 Measures for cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

SECTION 7: Handling and storage	Example for cardamom oil
Section 7.1 What precautions for safe handling need to be taken? Section 7.2 What measures need to be taken for fire and explosion protection? Section 7.3 What are the requirements for storage rooms? What are the requirements for receptacles? What is the recommended storage temperature?	Section 7.1 Precautions for safe handling: Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols. Section 7.2 Measures for fire and explosion protection: Keep ignition sources away - Do not smoke. Protect against electrostatic charges. Section 7.3 Requirements for storage rooms: No special requirements. Requirements for receptacles: Keep container tightly sealed.

SECTION 8: Exposure controls/personal protection	Example for cardamom oil
Section 8.1 What are the control parameters for safety monitoring? Section 8.2 What protective and hygienic measures must be taken? What respiratory protection must be taken? What eye protection must be taken? What body protection must be taken?	Section 8.1 Control parameters: No monitoring required Section 8.2 Protective and hygienic measures: Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Avoid contact with the skin. Avoid contact with the eyes and skin. Respiratory protection: In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device Eye protection: Tightly sealed goggles Body protection: Protective gloves. The glove material has to be impermeable and resistant to the product / the substance / the preparation

SECTION 9: Physical and chemical properties	Example for cardamom oil

Use results of the laboratory analysis to answer the following questions: Section 9.1 What is the physical state of your product (e.g. liquid) at 20^{0}C? What is the colour? What is the odour? Section 9.2 What is the flashpoint? Section 9.3 What is the flammability (i.e. auto-ignition temperature)? What is the danger of explosion? Section 9.4 What is the density of the product at 20^{0}C? Section 9.5 What is the solubility in water? What is the solvent content?	Section 9.1 Form: Liquid Colour: Yellow to brown Odour: Characteristic Section 9.2 Flashpoint: 53^{0}C Section 9.3 Flammability: Not applicable Danger of explosion: Product is not explosive. However, formation of explosive air/vapour mixtures is possible. Section 9.4 Density of the product at 20^{0}C: 0.928 g/cm^3 Section 9.5 Solubility in water: Not miscible or difficult to mix.

SECTION 11: Toxicological information	Example for cardamom oil
If toxicological information is not available in the ECHA database, check eChemPortal or TOXNET for toxicity information for your product. Section 11.1 What are the main toxic effects?	Section 11.1 Main toxic effects: Causes skin irritation. May cause an allergic skin reaction. Based on available data, the classification criteria for other toxic effects are not met.

SECTION 12: Ecological information	Example for cardamom oil

If ecological information is not available in the ECHA database, check eChemPortal or TOXNET for this information for your product. Section 12.1 What are the main toxic effects on the environment?	Section 12.1 Main toxic effects on the environment: Toxic for fish and other aquatic organisms. Danger to drinking water if even small quantities leak into the ground.

SECTION 13: Disposal considerations	Example for cardamom oil
Check the List of Waste established by European Union Regulation 2000/532 for disposal considerations. What is the recommended waste treatment method (e.g. incineration, recycling, landfilling)? You must discourage sewage disposal.	Recommended waste treatment method: Do not allow product to reach ground water, water course or sewage system. Must not be disposed of together with household garbage.

SECTION 14: Transport information	Example for cardamom oil

Provide transport information by mode of transport: • Land: International Carriage of Dangerous Goods by Road (ADR) • Marine: International Maritime Dangerous Goods (IMDG) • Air: Safe Transport of Dangerous Goods by Air (IATA) Section 14.1 What are the UN numbers for the substances in the product (divided by mode of transport)? Section 14.2 What is the proper shipping name (divided by mode of transport)? Section 14.3 What is the transport hazard class (divided by mode of transport)? Section 14.4 What is the packing group (divided by mode of transport)? Section 14.5 What are the environmental hazards (e.g. marine pollutant)? Section 14.6 What special precautions need to be taken by the user?	Section 14.1 UN number: 1169 Sections 14.2-14.6 ADR UN proper shipping name: EXTRACTS, AROMATIC, LIQUID, ENVIRONMENTALLY HAZARDOUS Class: 3 (Flammable liquids) Packing group: III Environmental hazard: Toxic to aquatic life with long-lasting effects Special precautions: • Danger code (Kemler): 30 • EMS Number: F-E,S-D • Stowage category: A • Limited quantities: 5L • Excepted quantities: Code: E1 • Maximum net quantity per inner packaging: 30 ml • Maximum net quantity per outer packaging: 1000 ml Transport category: 3 Tunnel restriction code: D/E IMDG, IATA UN proper shipping name: EXTRACTS, AROMATIC, LIQUID Class: 3 (Flammable liquids) Packing group: III Environmental hazard: Toxic to aquatic life with long-lasting effects Special precautions: • Danger code (Kemler): 30 • EMS Number: F-E,S-D • Stowage category: A • Limited quantities: 5L • Excepted quantities: Code: E1 • Maximum net quantity per inner packaging: 30 ml • Maximum net quantity per outer packaging: 1000 ml

SECTION 15: Regulatory information	Example for cardamom oil

Section 15.1 What specific European safety, health and environmental regulations apply to your product (e.g. Regulation 850/2004 on persistent organic pollutants)? What specific national regulations apply to your product in your country? Section 15.2 Have you carried out a Chemical Safety Assessment?	Section 15.1 European safety, health and environmental regulations: • Substance not listed in Annex I of EU Directive 2012/18 • Seveso category: E2 Hazardous to the Aquatic Environment; P5c FLAMMABLE LIQUIDS • Qualifying quantity (tonnes) for the application of lower-tier requirements 200 t • Qualifying quantity (tonnes) for the application of upper-tier requirements 500 t • Conditions of restriction according to Annex XVII of EU Regulation 1907/2006: group 3 (dangerous liquid substances) Section 15.2 A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information	Example for cardamom oil

What are the full meanings of the acronyms and abbreviations used in this SDS? What key literature has been used for compilation of this SDS?	Acronyms and abbreviations: ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods IATA: International Air Transport Association GHS: Globally Harmonised System of Classification and Labelling of Chemicals EINECS: European Inventory of Existing Commercial Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative Flam. Liq. 3: Flammable liquids – Category 3 Skin Irrit. 2: Skin corrosion/irritation – Category 2 Skin Sens. 1: Skin sensitisation – Category 1 Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2 Key literature: This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Download an exemplary Safety Data Sheet (SDS) for cardamom oil (311 kB, pdf)

Tips:

See our study on buyer requirements for natural food additives for an analysis of documentation requirements and other requirements in the European market.

Use our workbook for developing documentation for cosmetic ingredients if you target the European cosmetics market and need to develop an SDS and other documentation for cosmetic ingredients.

4. Sending samples

The analysis of samples helps European buyers determine if your product is suitable for use as an ingredient in their products. The analysis serves as verification of your claims on the product. Buyers want to make absolutely sure that the actual product meets the specifications that you provided to them. A slight

differentiation in specifications can significantly affect the properties of their end products. This can damage their valuable brands and cost them a lot of money.

European buyers test the samples on appearance and taste and on their physical and chemical properties. Depending on their specific needs, buyers may focus on different properties.

Most European buyers analyse the samples for possible adulterants (substances intentionally and unintentionally added to the product). Adulterants are a major concern, as they affect the suitability for specific applications and are frequently added intentionally, but also unintentionally. For example, collectors of raw plant materials for extracts may add raw materials from different plants without approval by the company that makes extracts from the plant material. Collectors are not always aware or capable of distinction between different plant materials. Moreover, extraction companies sometimes apply insufficient inspection methods to these raw materials.

Laboratories in Europe continuously improve their techniques for detection of adulterants in samples.

Your samples need to be approved by your buyers before you supply their order. When the order arrives, buyers often take random samples from various packing units to analyse them. This analysis serves to verify compliance of the entire order with the specifications in the contract. When the product supplied to the buyer does not have the same specifications as the sample you provided, the buyer can deny the product. This makes correct sampling before sending the order extremely important.

The role of samples in the sales process:

1. Sending of your offer with TDS to buyer to gain the buyer's interest
2. Request from buyer for sample (accompanied by TDS and SDS)
3. Sample analysis by buyer
4. Verification of your claims (based on TDS and results of sample analysis)
5. Feedback by buyer to you (approval for delivery or request for different quality)
6. Delivery of order
7. Analysis of supplied product by buyer
8. Feedback by buyer if analysis is inconsistent with previous sample analysis

Your sampling method must result in samples that are fully representative of your product specified with a lot number and/or sample number. It should also represent the quantity, quality and time schedule of your buyer.

This implies that you only take samples after you have finished all the production steps, when the product is ready to be exported.

In addition, you have to homogenise your product (blending of essential oils from different distillation batches to obtain a uniform quality). This means you make sure that all your products in one lot have the same properties. Don't have the capacity to homogenise the quantities required by your buyer? This means your buyer may have to analyse more samples from different packing units. This is more expensive. You can offer a lower price to offset these extra costs for the buyer.

Comply with the ISO standards for sampling of essential oils to ensure that you apply appropriate sampling:

- ISO 212:2007: Sampling of essential oils
- ISO 356:1996: Preparation of essential oil test samples

The label on your sample must comply with European Union legislation on Classification, Labelling and Packaging (1272/2008). See the section in this workbook on developing a Safety Data Sheet for more information on labelling of hazardous materials, including extracts.

Checklist for samples before sending them to buyers:

- Was the sample taken from a specific lot of your ready-to-export product?
- Does your sample meet the specifications in your TDS?
- Essential oils: Is the sample size compliant with ISO standard 212:2007 or buyer requirements?
- Is the sample size compliant with the requirement of the buyer?
- Is the sample container clean and does the label have all relevant information from the buyer (i.e. product name, lot number, lot size, sample number, date of sample)?
- Does the label on the sample comply with European Union legislation of Classification, Labelling and Packaging?
- Is the sample accompanied by a TDS and SDS?

Tips:

Check the website of Eurofins for an example of a European laboratory for analysis of samples.

Learn more about good sampling practices in the guidelines of the Codex Alimentarius.